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P1117**Oxygen sensor heating 1 ahead of catalytic converter - below lower threshold.****P1121****Oxygen sensor heating 2 ahead of catalytic converter - below lower threshold.****Function**

The heated oxygen (HO2) sensor generates a current signal starting at approximately 300°C that determines the fuel/air mixture. This signal is used for the regulation of the fuel injection. To assure that the HO2 Sensor reaches its operating temperature earlier, the HO2 Sensor is heated. The HO2 Sensors after the TWC are used to monitor the conversion rate.

Diagnostic conditions

During a cold start (HO2S readiness after 20 seconds) the time t_1 is measured. t_1 is the time from switching the HO2S heating on until the time an HO2S is operational. Then a time t_2 is calculated ($t_2=2.0*t_1$). t_3 is the time from switching the HO2S heating on until the time the other HO2S is operational. When t_3 is larger than t_2 , a fault is recognized.

When a fault is recognized, the resistance comparison of the heating of the HO2S is blocked. If no fault is recorded, the calculated resistance of the HO2S heating is compared to a threshold after 450 seconds. If the resistance is too high, a fault is recognized for both HO2S.

DTC No.	Fault conditions	Fault area
P1117	Heating current too low	-Transition resistance
P1121		- Heating current too high - Interruption in heating circuits - Interruption in sensor signal wiring - Short to B+ (End-stage switched off)

Note

Heating of H02S (1 and 2) behind the TWC is operated by an end stage. It is possible that both heating circuits are recorded as a fault although only one heating is faulty.

If an **additional** H02S fault is recorded, correct this fault first and road test vehicle.

When all 4 heating circuits are stored in the fault memory, check the joint voltage supply.

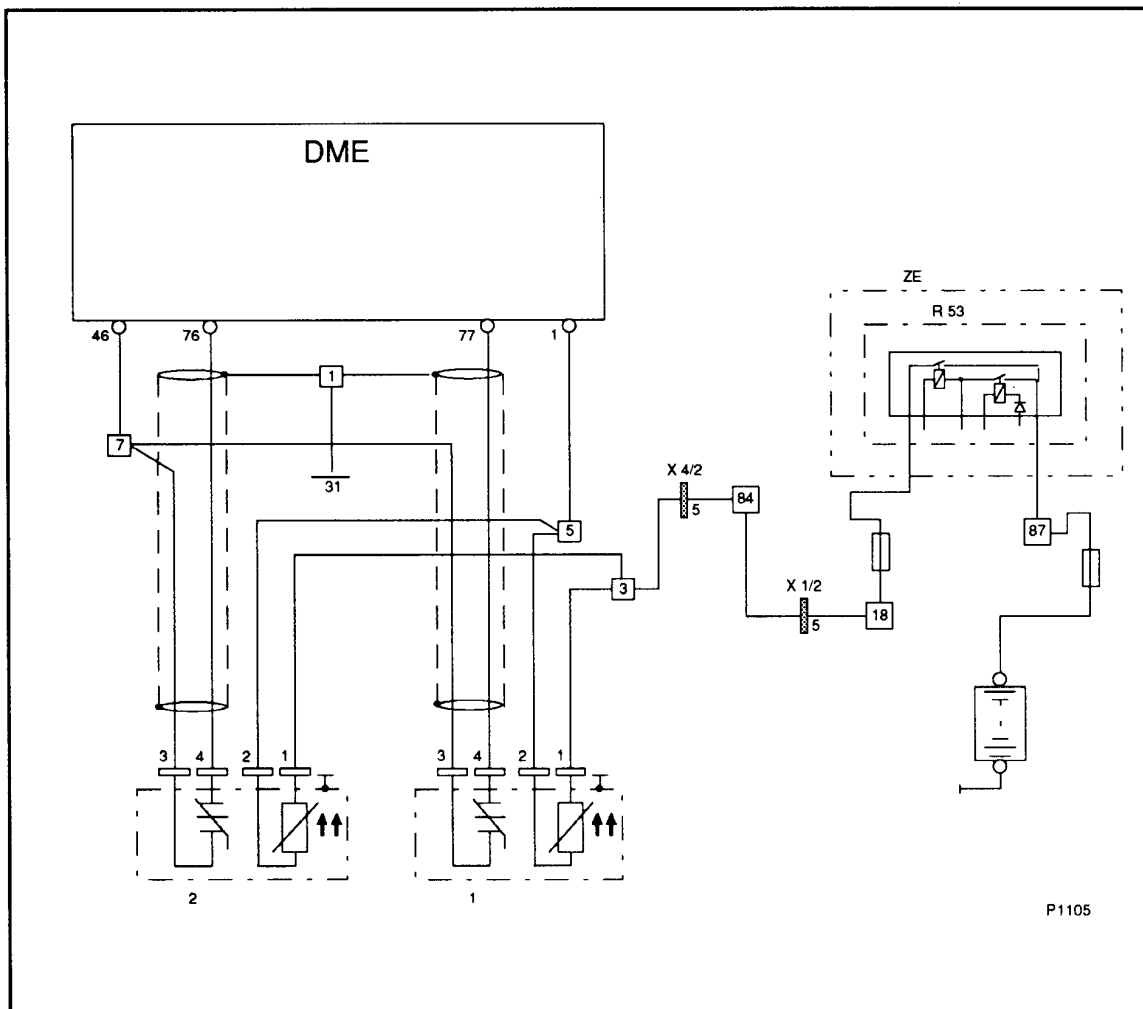
H02S 1 - cylinders 1 to 3

H02S 2 - cylinders 4 to 6

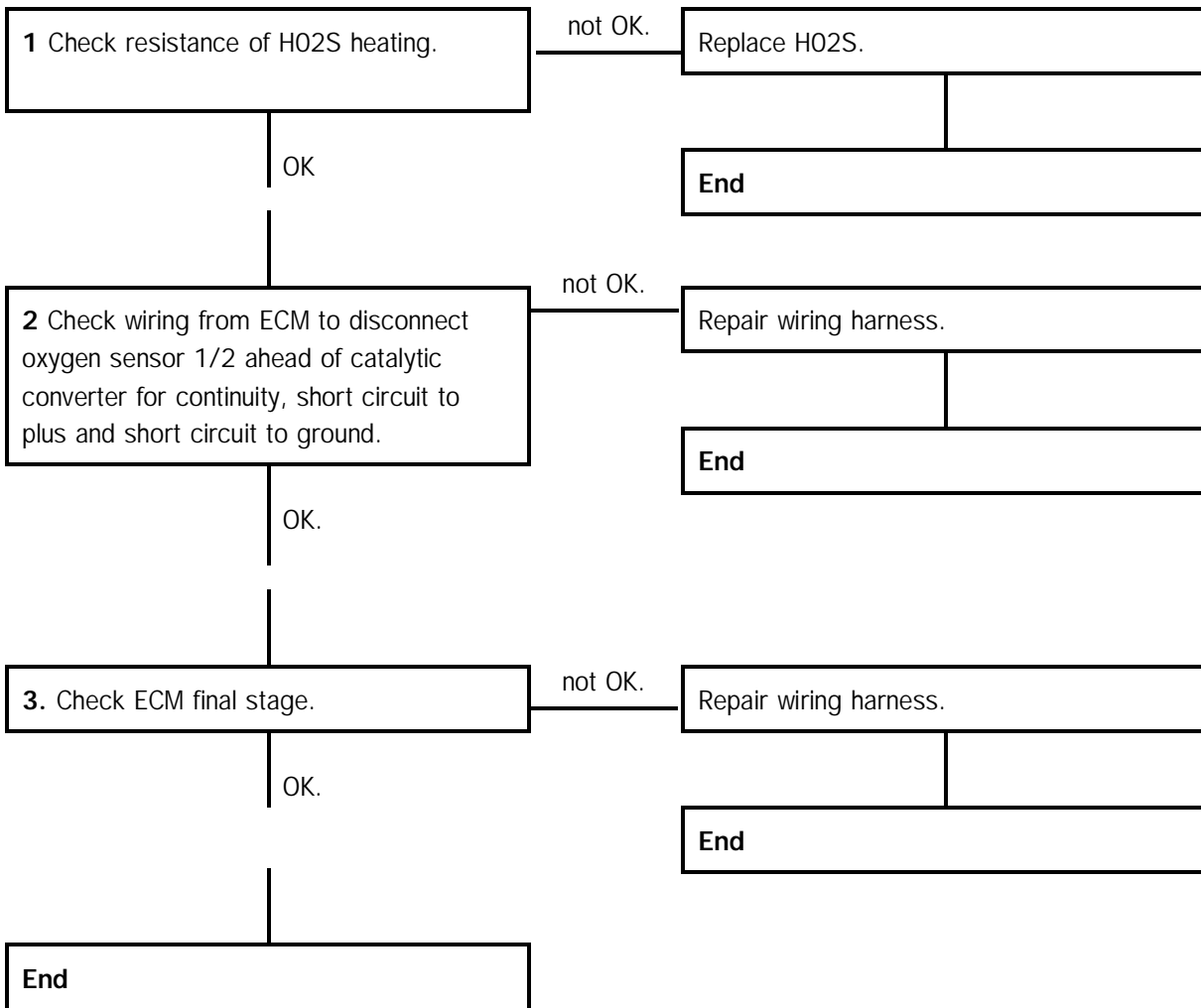
Connector color gray - after TWC

Connector color black - ahead of TWC

Wiring Diagram



P1105



1 Check resistance of H02S heating.

1. Remove connector for H02S 1/2 behind TWC.
2. Connect ohmmeter on pin side to pin 1 and pin 2.
Specified value: 1.8 - 2.5 Ω at 20 °C
3. Connect ohmmeter on pin side to pin 1 and the oxygen sensor housing.
Specified value $\infty \Omega$

2 Check wiring from ECM to H02S, connectors 1/2 for continuity.

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|---|--|
| <ol style="list-style-type: none"> 1. Remove connectors for H02S 1/2 behind TWC. 2. Remove ECM connector. 3. Connect ohmmeter to ECM connector pin 30 and connector for H02S 1/2 after TWC, pin 2.

Specified value: < 1 Ω 4. Connect ohmmeter at sleeve to connector, pin 2, and ground.

Specified value: $\infty \Omega$ | <ol style="list-style-type: none"> 5. Remove ECM relay and bridge terminals 30 and 87 b. 6. Connect voltmeter at sleeve to connector, pin 2, and ground.
Specified value: 0 Volt |
|---|--|

3 Check wiring from ECM to H02S, connectors 1 and 2 for short to B+.

1. Remove connectors to H02S 1 and 2 behind TWC.
2. Start engine and run engine at high speed for ten minutes.
3. Connect voltmeter at sleeve to pins 1 (plus) and 2.

Specified value: battery voltage